SOME ORGANIZATIONAL CHANGES FROM THE INCORPORATION OF ICT. A STUDY OF CASES IN TWO CENTERS OF ELEMENTARY EDUCATION

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Abstract

In this communication we try to show the conclusions of an investigation [1] which aim was to analyse the changes experienced by the organization of the primary centers with the progressive incorporation of the computer technologies. At the moment of introducing the above mentioned technologies, tensions and confusion are generated but also innovation and change expectancy, of wich it finally follows a series of actions in the shape of modifications or variations in their organization. For it, in this study we investigate about questions as what role does play the commission of pedagogic coordination? What do the teams of teachers say in this process? What paper does the coordinator of computer play? What relations does this one establish with the chief of studies and with the intermediate organs of coordination? etc.

To answer about these questions we realize a study of case in two schools of Elementary education of the Valencian Community (Spain). In both cases we concentrate on the program of computer science, so much of the center as the institutional one, on the utilization of technologies on the process of the administrative - pedagogic documentation of the school; on the paper of the agents involved in the application, coordination and organization of the computers; on the commissions labor and equipments of teachers; on the origin of resources and criterious established as for the disposition, the space, the time and the implied persons; and finally, on the organization of the teachers formation.

We end up by indicating different aspects that necessarily would have to be given in order that the technologies were managing to be integrated to the center organization: the elaboration of a program of computer science according to the principles of the educational project; the need to give a stability to the figure of the person in charge of the computer technologies; the utilization of the Commission of Pedagogic Coordination like organ of coordination for the cohesion of the program; the establised criterious of organization around space and time (disposition and number of equipments in the classroom of computer science, flexibility of schedules, etc.); the constant professorship update in the use of technologies, etc.

Key Words

Research on Technology in Education, Research Methodologies, Information and communication Technology (ICT), Organization.

1. INTRODUCTION

The entry of the technological resources of computer character in the school centers is a topic that for two decades is acquiring increasingly importance. Little by little the knowledge and the application of the computer equipments are more introduced in our educational institutions from the first levels of the educational system. The intention of the school centers continues being to form to the futures citizens of our society, nevertheless this one is highly tecnologizada and intends of dizzy form towards that global village advocated by MacLuhan at the beginning of the seventies, towards nowadays named *Society of the information and of the knowledge*. In this open process the claims are insistent towards the school organization in order that adapt its structures in order the accommodation of the computer technologies.

The raised challenge needs a great effort for the school institution; effort in the formation of the educators who shape it; effort as for the endowment of sufficient resources to attend, on the one hand, the utilization for the group - class in the diverse situations of education - learning and, for other one, to develop administrative labors the teachers; effort also in the teaching of the curriculum collected in the *Educative Center Project* (ECP); and finally an effort in the organization of the educational institution, specially in the organs of coordination intermediate and in the persons who govern them. Evidently, if we wish an innovative school, permeable to the technologies but vigilant before the values that it represents, and in continuous transformation towards the attainment of the changes that the society claims, we will have to assume the efforts indicated as part of our daily work.

The origin of this work is framing in this expectation context that from the different areas exists around the integration of the computer appliances. Therefore, the investigation that we present is fitted in the studies related to the means of education, concretly with the information and comunication technologies and among them, specifically the computer technology. The school stage in which we place, across a study of two cases, is that of the Primary Education (from 6 to 12 years) in the Valencian Community; and the analysis area is the organizational dimension of the means.

We investigate so on the changes that induce the introduction of the computer resources in the educational organizations and we centre on the analysis of the organizational elements of two schools in our Community. The knowledge of the organizational structure, the examination of the technological appliances and of the implied persons, and the study of its programs and projects, etc. shows the efforts that are produced in the school organizations to adapt to the new requirements. So we present in firstly how it has been raised this theme in the investigation in means, after which we will enter fully in the results obtained in the study of both cases and we finish with a few performance offers in the matter.

2. THE RELATION ICT – SCHOOL ORGANIZATION IN THE INVESTIGATION IN MEANS

After analyzing the state of the question we verify that if, at the beginning of the nineties, Morgan was thinking that the organization was generally complex, ambiguous and paradoxical, Kerr (1993) was indicating already the analysis organizacional of the schools, under the technological change conditions, as an emergent aspect in the investigation. Another author Newman (1992) was also pleading for the study of the effects that computer technologies produce in the centers organizations; his interest was departing from the theory that links the learning process directly to the types of social interactions that give form to the education.

Though the studies were scanty up to these moments, we find also that of Moldstad (1989) on utilization and accessibility in the classrooms; the realized one to great scale for Pelgrum and Plomp (1991) in 19 countries in which they conclude that when the organizational problems are solved and the computers are accessible these are in use with instructives objectives; and that of Plomp and Pelgrum (1992: 186) in that they were confirming that " the schools have to develop new relations of the internal functioning in response to the technological changes in its environments ", nevertheless they were unable to reveal specific indications on the school restructuring as consequence of the computers use.

Well, after this first incursion in the bibliography what can we say on the relevancy of the topic in question? So, that is important to study this educational phenomenon for several reasons:

- First for the novel of the introduction of the appliance in the schools, which it makes necessary to examine the effects that in them it provokes. Undoubtedly this instrument has to get accommodated in the schools and these be reorganized to give it content.
- Secondly, for the tremendous impact that is producing in a society in whom, in words of Tezanos (1989) there is a "extraordinary popular sensibility to the new technologies", and specially among younger that it forces the centers to question it role in the technological incorporation process.
- Thirdly, is also justified from scientific areas because still are not abundats the presented works and this one contributes to the interest of the ghosts lately. Therefore there are scanty the studies that contemplate the repercussions of the technologies in the centers organization, both from the point of view of the Administration and from those who there take part: teachers, pupils, mothers and parents … Since in other areas, the managerial one, that of the work … yes that has exist.

3. INITIALS CONSIDERATIONS IN THE INVESTIGATION

Bearing in mind that our investigation analyzes the changes that experiences the organization of two centers of primary with the progressive incorporation of the computer technologies, it is important to indicate some key questions that we appear before initiating the fieldwork.

First, the computer technologies modify the delicate balances that are established in the centers and that crystallize in its organizational structure. At the moment of introducing them tensions are produced, confusion but also innovation and change expectancy, of that derive a series of actions in the shape of modifications or variations in its organization. Its analysis and interpretation is the aim of this investigation.

Also it is important to observe that though we concentrate fundamentally on the organization of the centers, also there is an institutional area influenced by the ICT. That is to say, the repercussions of the process of technological introduction not only take place in relation with the organs of direction and coordination, but also they modify the relations between parents and center, among the own teachers and between teachers and pupils. These multiple interactions have been an object of examination to explain the role that they occupy in the process of computer integration.

On the other hand, we cannot stop studying the centers relations with the programs of computer science introduction of the autonomous Administration. Procedure, criteria, equipment and maintenance are questions with which we must deal and, in this official context, we cannot forget the directives that in technological matter come from upper authorities, for what it will be necessary to examine those that come from national and european orbits to clarify its repercussions in our territorial space.

And certainly, in view of the object of the investigation, it is crucial to pay attention on the center organization and concretly on questions as: the role that the commission of pedagogic coordination performs, which the teams of cycle think of this process, the functions that it assumes the computing coordinator and the relations that he establishes with the studies chief and with the organs of coordination intermediate also they have claimed our attention. Besides other matters that affect the school organization as are recounted to the time and space: the pupils and teachers schedules, the groupings, the computer science classroom location, the appliances and materials disposition, the distribution in other spaces, etc.

For all this, and after the bibliographical review, we decide to depart from certain suppositions or premises on which we rest to develop the study:

1. The *Educative Center Project* (ECP), the *Annual General Programme* (AGP), the *Memory of Activities* and the *Internal Régime Regulations* (IIR) constitute essential instruments for the organizational context of the centers cohesion, being necessary in the process of computers integration.
2. The *computing coordinator* is one more teacher, got in the organization of the schools at the moment the computer science program of our Community is appeared, but the characteristics that in the first moment he was assembling (functions, formation, dedication, etc.) are questioned in the organizational current structures.
3. Space and time are elements of the organization that, in relation with the technological integration, are subject to continuous changes and that concern the personnel of the school.

4. The teams of cycle and the commissions of teachers represent the organizational natural scenes where there develop the social interactions that influence the general intention of the application of the computer resources.
5. The permanent training of the professorship in computer technologies is a part of the organizational work of the persons in charge of the computer science program and of the managerial team of the school centers.

From these premises, we wanted to analyze the program of computer science, so much that of a center in concrete as the institutional one; the utilization in the process of the administrative - pedagogic documentation of the school; the role of the agents involved in the application, coordination and organization of the computer resources; the labor of the commissions and teams of teachers; the origin of the resources, and the established criterious as for the disposition, the space, the time, and the implied persons; and finally the organization of the teachers formation. For all this, we design the study of cases that we present immediately.

4. A STUDY OF CASES: TWO SCHOOLS OF PRIMARY EDUCATION OF THE VALENCIAN COMMUNITY

To raise the presented aims, the approach that we consider to be more pertinent is that of the qualitative tradition of investigation. Precisely, inside this tradition we rest on the ethnographic perspective and on the technique of the study of cases, since it describes and analyzes "uniques or not much current situations " (Ary, Jacobs and Razavieh, 1987) and especifically in that Stake (1999) names *instrumental study of cases* and also in currents of thought that suppose a theoretical frame that us guides in the methodological approach, as for example the Symbolic Interaccionism.

With this qualitative perspective the design of the field investigation has been formed definitively as a study of 2 cases: two primary schools of the Valencian Community in which studying the questions raised in the project. The above mentioned schools were selected depending on a few fundamental criteria: that were having a few minimal technological conditions (it is to say, an acceptable computer equipment that was used during a sufficiently long time), the existence of some innovation project in which they inform the computer technologies and, how not, the real possibilities to access into the centers.

In this fieldwork, which approximately lasted two school years, the sources of data capture have been: documentaries (diverse written materials of the studied centers, so much administrative, legislative, organizational and didactic); the informants, that is to say, those persons related to the case that they have offered us some information across the semiestructured interviews, the groups of discussion and the informal conversations; and finally, also we have contemplated the material elements like they are the objects and appliances, supports, stays, etc. that by means of the observation not participant, the manipulation and the study have informed, equally, to the investigation.

After approaching the aims of our investigation in these two centers, we can do the following verifications:

1. On the one hand, in the centers documentation different points of view are demonstrated, before a common fact, as it is the organization of the computer equipments utilization. And at the same time it raise doubts about the character of a few organizations that are not provided with mechanisms that renew with major agility the documents that define it style and construct its acts. The slowness of the process is such in both centers that when they update a document already other one is out of phase.
2. The primary schools disposition of of a coordinator with updated formation, school reduction, functions definite and compromised in the help to the user-teacher facilitates the use of the computer technologies in the didactic - administrative activities of the centers, since this way it happens in one of the schools. It absence, insufficient formation or exiguous hourly assignment implies dependence towards technical personnel, or centers of assistance to solve the effects that happen in the centers and that suppose sometimes the suspension of the activities with computer technologies. As a teacher was saying to us, " For many of the problems that we have it is necessary to call our supplier to solve them ".
3. If we attend to the variations that organization experiences of both analyzed schools when they try to conjugate the spatial and temporary aspects (occupation, location, distribution, schedules, assistance, groupings, displacements, etc.) we indicate that they are multiple and

constant in the intersests of which the introduction of the computer technologies is realized attending so much to the worries of the teachers, to the desires of the pupils as well as to the characteristics of the available material. In a visit to one of the schools we observe that they had returned to change the distribution and the disposition of the computer equipments, after the accomplishment of a group of discussion about a partial report that we had presented to the direction.

4. As for the teams of cycle and the teachers commissions we verify their good predisposition towards the introduction of the computer appliances in the activities, but showing divergent sensibilities as for the organizational necessary measurements to support the process. In this respect we have verified that the teams of cycle do not enjoy the same consideration in the organizational structure in both analyzed centers; even, in the same center, not they all conceive of the same form their role at the moment of assuming responsibilities in the utilization curricular of the computer technologies. Only a teacher was thinking incisively that " the computer science forms a part of the school curriculum and has to of treating itself in the cycles as all the areas of the curriculum and they must be the cycles those that they programme, the tutors those who are implied". And with the latter aspect, that of the implication of the tutors, she was coinciding literally with her headmaster. On the other hand the commission, at least that of pedagogic coordination, in both cases is constituted in the scene where there is brewing the majority of the organizational decisions that orientate the program, though the computing coordinator is not a member of the same in the first case and coincide the deputy head and the coordination with the second one.
5. Finally, as for the formation of the professorship in computer technologies the fieldwork has made us see the importance of this point in every center, on having observed that the differences as for the measures proposed by both directions have reflected finally the different levels that have reached of computer integration. In this sense we have verified a major development in one of the schools owed, among other things, to a continued project of formation. This way, it headmaster was saying to us that "Initially we were very shy with the computer science because we did not know it; then we have been learning. It has been a continuous learning process".

5. LIKE PROPOSALS

After the verifications indicated in the previous paragraph, we want to conclude with some proposals that in our opinion they would contribute to the improvement of the panorama described in the centers of elementary education analyzed. The first and fundamental is that the set of the worries and commitments of a center on the process of computer integration in it organization should take form of a document: the program of computing of the school, as product of the consensus general and derived from the principles that on the subject of technological innovation the *Educative Center Project* (ECP) indicates. We propose to tell, therefore, with a pedagogic of integration instrument that it should add the individual contributions of the teachers, gather the common aims, explicite the organization that sustains it, arrange the means, establish the procedure of use and of the behavior of the users, and contemplate mechanisms of follow-up and evaluation.

Nevertheless, being the educational project the fundamental setting in the process of adequacy of the computer technologies, we find a serious problem in the resistances among the teachers of these centers towards the documentary development. If the aims are not planned anually, if they are not evaluated, if the internal procedure are not established and, especially, if it do not get up-to-date constant little it can do the documentary context in favor of the computer integration. Therefore, we consider granting major importance and means towards those periods in those who are debated and one reflects on the features that define these documents, the actions that they propose and the procedure that are going to apply.

On the other hand, the person in charge of the computer technologies should turn into a stable figure into the organizational structure into the school. Consistent, him there must be awarded functions according to his responsibility. With schedule specific and adapted to attend to his tasks, and to be summoned for the meetings of the coordination organs in those who treat each other the actions to realize in the process of computer integration Though we notice, in both centers, the excessive

power that they can reach, since they turn in indispensable into the "particular consultations " of the professorship, and the control of the key resources can wake both affinities and discords.

Equally, after observing in the schools a high technological equipment that raises organizational difficulties, we can say that the quantity of computer technologies of the center has to be proportional to the capacity of maintenance of the same ones, already be on the part of the coordinator, the technical service or specializing company. We coincide with authors like Poole (1999), Kozman and Schank (2000) or Bates (2001) in the importance of the infrastructure of maintenance. We indicate therefore like necessary to help in the process the establishment of criteria of organization around the space and the time: disposition and number of computers in the classroom of computer science, assignment of equipments, position of the teacher, flexibility of schedules, supports, etc.

And as for the teams of cycle, we have verified that one that Gonzalez (2003) warns: that the simple fact of their formal existence does not guarantee relations of collegiality and collaboration among the teachers. Nevertheless, the trend in both studied centers intends towards the increasing utilization of the computer resources, which prompt will force to organize more conscientiously it use and where the labor of the team of teachers can be very relevant, for what it is necessary to develop functions related to the organization curricular in the cycle.

In the same way we want to indicate that in absence in the studied schools of a specific commission on technologies, the utilization like organ of coordination of the *Commission of Pedagogic Coordination* reveals like crucially for the cohesion of the program. Consistent we propose to articulate the relations of the person in charge of the computer technologies with the Commission. Tasks like to inform about his management, to gather the initiatives of the coordinators of cycle and to coordinate the technological - educational activities in the center, will have to be meditated in the general planning of the commission. These functions, on not having formed a part of the attributed ones to the commission in the in applicable legislation, will have to be included in the *Internal Régime Regulations (IRR)*.

To finish, we raise that the managerial team and the computing coordinator must unite efforts and to present a global offer for the school course in the frame of the *Annual General Programme* (AGP), after the analysis of the available means and according to the needs and suggestions of the professorship. To increase or to update regularly the training level of the teachers, so much for the administrative tasks as the didactics of the school, is an aim of the organizational work in the organs of direction.

Notes:

[1] Peirats, J. (2006): *Organizational Variants generated by the Information Technologies. A study of cases in the primary centers of the Valencian Community*. Doctoral Thesis. Universitat de València.

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